

REMARKS

In the Office Action dated May 20, 2008, the Examiner rejected claims 1, 3-5 and 14 under 35 USC § 102(b) as anticipated by U.S. Patent No. 4,475,360 issued to Suefuji et al. ("Suefuji"). Applicants traverse this rejection and seek favorable reconsideration in view of the following remarks.

In rejecting independent claims 1 and 5 and dependent claims 3-4 and 14, the Examiner asserts that each and every element of these claims are identically disclosed by Suefuji. Applicants submit as more fully presented below that the Examiner has misconstrued the teachings of Suefuji and/or misapplied them in rejecting claims 1, 3-5 and 14 as anticipated.

The present invention discloses and claims in independent claim 1 a scroll wall arrangement for a scroll compressor having a fixed scroll wall and an orbiting scroll wall which together define a plurality of flow paths having respective inlets for simultaneous pumping at different pressures, and a first flow path extending from a first inlet to an outlet and a second flow path extending from a second inlet to the outlet where the second inlet is isolated from the first flow path, and where the first and second flow paths converge to form a merged flow path. The present invention discloses and also claims in independent claim 5 a scroll compressor comprising a scroll wall arrangement having a fixed scroll wall and an orbiting scroll wall arranged to form a first flow path and a second flow path, and each flow path has an inlet for pumping a gas at different pressures, where the inlet of the first flow path and the inlet of the second flow path extend to an outlet and where the inlet of the second flow path is isolated from the first flow path, and the first and second flow paths converge to form a merged flow path.

Applicants respectfully submit that Suefuji (as well as the other cited references) do not disclose and anticipate claims 1, 3-5 and 14.

If one were to consider a scroll pump which can be acting as a compressor – gas enters generally at the periphery of the scroll mechanism and is compressed towards the center of the mechanism towards the exhaust port. A pumping channel or flow path is formed between adjacent fixed scroll walls. Intermeshing orbiting scroll separates this channel or flow path into a series of inner and outer crescents. Close radial tolerance between orbiting scroll wall and fixed scroll wall provide the isolation between adjacent outer crescents and similarly between adjacent inner crescents. These crescents share a common inlet at the outer ends of the wrap (where the gas enters the mechanism) and a common outlet at the center of the mechanism. As the shaft rotates these crescents are created and progress (getting smaller and smaller) from the outer to the inner part of the mechanism thus compressing the trapped gas and transporting it to the exhaust port.

It appears that the Examiner is of the opinion, or at least implicitly asserts, that the inner and outer crescents formed between the orbiting scroll and fixed scroll disclosed by Suefuji are independent pumping paths, within a single pumping channel or flow path. Assuming *arguendo* that the inlets 15a and 15b of Figure 2 of Suefuji are small enough to be cover and therefore isolated by the orbiting scroll wall top, then again assuming *arguendo* the gas streams introduced at these inlets remain separate until they meet at the outlet. However, Suefuji teaches the first inlet 7 is in connection with both inlets 15a and 15b because gas entering inlet 7 occupies both inner and outer crescents within the pumping channel. Accordingly, this means that at the point of entry (15a and 15b), there will be mixing of the first gas inlet and second gas inlet and therefore there will be no pumping in parallel of unmixed gas within the mechanism. More specifically, Suefuji discloses interstage pumping where there is a main gas stream from a first inlet being joined directly by a second gas stream from a second inlet (positioned between outer wraps and center of the mechanism), and there is NO separation of the gas flow through the mechanism!

What is disclosed by the present invention and claimed in rejected independent claims 1 and 5 is quite different. As shown in one aspect of the invention regarding Figure 6(a) and disclosed on page 7 line 31 to page 8 line 13:

"Figure 6(a) shows a fixed scroll 86 having fixed scroll walls 88, the orbiting scroll wall 89 being shown in Figure 6(b). A first flow path 90 extends from a first inlet 92 to the outlet 94. A second inlet 96 is isolated from the first flow path 90 by approximately two wraps of the fixed scroll. A second flow path 98 extends from the second inlet 96 through approximately 700° where it merges with the first flow path 90 and extends to outlet 94. The arrangement shown in Figure 6 may be advantageous over the arrangement shown in Figure 5 in that greater isolation of the pressure at the secondary inlet 96 from the first inlet 92 can be achieved, for example, when a greater differential pressure is required.

The arrangement shown in Figures 5 and 6 is further advantageous in certain pumping applications where it is preferable to provide some isolation of the gas species being pumped at respective inlets. Consequently, in these arrangements the first inlet and the second inlet can be used interchangeably as required due to the independence of the two inlets."

As is shown in Figure 6(a), a gas enters the mechanism at a first inlet and follows a path defined by adjacent fixed scroll walls denoted by the dark line to the exhaust at the center. Also shown is another inlet where gas enters the mechanism at a second inlet and follows a path as defined by adjacent fixed scroll walls denoted by the dashed line for two wraps until it gets to the first gas path. Accordingly, as disclosed by the present invention and claimed in rejected claims 1 and 5, the first gas channel or path and the second gas channel or path are separated within the mechanism. With the

orbiting scroll in place, one can readily see that gas entering the first inlet will be present in both inner and outer crescents (created between the orbiting scroll and the fixed scroll) as it follows the path towards the center. Similarly, gas entering the second inlet will be present in both inner and outer crescents until the point where the dashed and solid lines meet. The gas in the pumping channels or flow paths is trapped within a series of inner and outer crescents that is formed between the fixed scroll and the orbiting scroll. It can be readily understood that there will be a series of complete inner and outer crescents between the second inlet will meet as shown in Figure 6(a) at the point where the dashed and solid lines meet. Similarly, there will be a series of complete inner and outer crescents between the first inlet and the point where the dashed and solid lines meet.

According to the disclosure of the present invention the design of the fixed scroll and orbiting scroll, results in these two channels or flow paths containing their complete crescents are separate until the point where they meet as shown as the meeting of the dashed and solid lines in Figure 6(a). This allows for isolation and compression of the gas introduced at the second inlet within the pumping mechanism before it mixes with the gas introduced at the first inlet at their point meeting.

Applicants respectfully submit that Suefuji does not anticipate independent claims 1 and 5.

Since rejected claims 3, 4 and 14 depend from independent claim 1, they are not anticipated by Suefuji for at least the same reasons that claim 1 is not anticipated by Suefuji.

The Examiner has rejected independent claims 1 and 5 as being anticipated by Publication Number JP61-258989 Ikegawa et al. ("Ikegawa"). Applicants traverse this rejection and seek favorable reconsideration in view of the following remarks.

Applicants submit that Ikegawa does not disclose each and every element of rejected claims 1 and 5. Just as is discussed above regarding the rejection of these claims as anticipated by Suefuji, Ikegawa does not disclose a scroll wall arrangement as claimed in claim 1 having a fixed scroll wall and an orbiting scroll wall, which together define a plurality of flow paths having respective inlets for simultaneous pumping at different pressures, wherein the plurality of flow paths comprise a first flow path extending from a first inlet to an outlet and a second flow path extending from a second inlet to the outlet, and wherein the second inlet is isolated from the first flow path, and wherein the first and second flow paths converge to form a merged flow path. Nor does Ikegawa disclose a scroll compressor having a scroll wall arrangement as claimed in claim 5 having a fixed scroll wall and an orbiting scroll wall arranged to form a first flow path and a second flow path, each flow path has an inlet for pumping a gas at different pressures, wherein the inlet of the first flow path and the inlet of the second flow path extend to an outlet and wherein the inlet of the second flow path is isolated from the first flow path, and wherein the first and second flow paths converge to form a merged flow path.

Applicants respectfully submit that Ikegawa does not anticipate claims 1 and 5.

The Examiner rejected claim 8 under 35 USC § 103(a) as obvious over either Suefuji or Ikegawa in combination with U.S. Patent No. 4,919,599 issued to Reich et al. ("Reich").

The Examiner asserts with respect to claim 8 that since Suefuji or Ikegawa discloses the invention as recited with respect to the rejections of claims 1 and 5, that in view of the stated teachings of Reich, it would be obvious to combine the teachings of Suefuji with Reich or Ikegawa with Reich to render claim 8 unpatentable under 35 USC §103(a).

Applicants respectfully submit that since the teachings of each of Suefuji and Ikegawa as discussed above with respect to claims 1 and 5, do not disclose "a scroll

compressor comprising a fixed scroll wall and an orbiting scroll wall arranged to form a first flow path and a second flow path, each flow path having an inlet for pumping a gas at different pressures, wherein the inlet of the first flow path and the inlet of the second flow path extend to an outlet and the inlet of the second flow path is isolated from the first flow path and wherein the first and second flow paths converge to form a merged flow path ..." as claimed in independent claim 8, the combination of the cited teachings of Reich with either Suefuji or Ikegawa do not achieve nor render obvious independent claim 8.

The Examiner rejected claim 13 under 35 USC § 103(a) as being obvious over either Suefuji or Ikegawa in combination with U.S. Patent No. 4,696,627 issued to Asano et al. ("Asano").

The Examiner asserts with respect to claim 8 that since Suefuji or Ikegawa discloses the invention as recited with respect to the rejections of claims 1 and 5 but that each of Suefuji and Ikegawa fails to disclose "a position of the second inlet with respect to the first flow path" and that Asano teaches, in part, that it is conventional in the scroll compressor art to utilize a second inlet 11 being isolated from the first flow path by one revolution of the fixed scroll wall, and concludes, in part, that "It would have been obvious to ... have utilized the position of the second inlet, as taught by Asano" Applicants respectfully submit that since the teachings of each of Suefuji and Ikegawa as discussed above with respect to claims 1 and 5 do not disclose a fixed scroll wall and an orbiting scroll wall, which together define a plurality of flow paths having respective inlets for simultaneous pumping at different pressures, where the plurality of flow paths comprise a first flow path extending from a first inlet to an outlet and a second flow path extending from a second inlet to the outlet and wherein the second inlet is isolated from the first flow path" as claimed in independent claim 13, the combination of the cited teachings of Asano with either Suefuji or Ikegawa do not achieve nor render obvious independent claim 13.

Although Applicants are entitled to have the relevant prior art cited by the Examiner in an Office Action in a timely manner, and not on a piecemeal basis, Applicants wish to note that notwithstanding the view of the Examiner that Applicants sought reconsideration of the Finality of the Office Action, Applicants did not seek such reconsideration but did seek reconsideration of the rejections of the unamended claims based on the cited references.

In conclusion, Applicants respectfully submit that: claims 1, 3-5 and 14 are not anticipated by Suefuji; claims 1 and 5 are not anticipated by Ikegawa; claim 8 is not obvious over either Suefuji or Ikegawa in combination with Reich; and claim 13 is not obvious over Suefuji or Ikegawa in combination with Asano.

Applicants submit that all of the claims are allowable and respectfully solicit a Notice of Allowance.

Respectfully submitted,



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